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distinct attachment of a rib on both sides to each vertebra by a ball and socket-joint. It is remarked, that in this tribe of animals the relative positions of the ball and socket are reversed from their usual situation, the socket being attached to the extremity of the rib, and fitted to a protuberance from the body of the vertebra, instead of the extremity of the rib being applied to an indentation between two adjacent vertebræ. Hence the ribs do not in any degree interfere with the motion of the vertebræ upon each other, as in other animals.

The muscles by which these motions are performed, are also described by Mr. Home; but the distribution of them cannot readily be understood, without reference to the drawings which accompany the paper.

At the termination of each rib is a small cartilage, which rests for its whole length on the inner surface of the corresponding abdominal scutum, to which it is connected by a short muscle.

The scutum being thus moved by a rib from each side, its posterior edge lays hold of the ground, and becomes the support by which the adjacent portion of the body is propelled forwards, and by a series of alternate motions is capable of renewing the impulse with considerable rapidity.

Mr. Home remarks, that in the *Draco volans* the wings, by which the animal flies, are supported by ribs, which form the skeleton of them; but in this instance the elongated ribs are superadded, for the sole purpose of forming the wings, and do not, as in the snake, assist in the process of respiration, at the same time that they are employed in giving progressive motion.

An Account of some Experiments on the Combinations of different Metals and Chlorine, &c. By John Davy, Esq. Communicated by Sir Humphry Davy, Knt. LL.D. Sec. R.S. Read February 27, 1812. [*Phil. Trans.* 1812, p. 169.]

The principal objects of these experiments is to determine the proportions in which oxymuriatic acid or chlorine combines with various metals; but the author has also extended his inquiry to the relative proportions, in which oxygen also, and sulphur, unite with some of the same metallic substances.

Of copper, Mr. John Davy notices two compounds, to which he gives the names of Cuprane and Cupraneæ. The former is the same as the resin copper of Boyle, which may be obtained by heating together one part of copper with two parts of corrosive sublimate. This compound is also the same as that named by Proust, white muriate of copper, who obtained it by mixing together muriates of tin and copper; and Proust observed that the same compound might be procured, by heat, from the common deliquescent muriate of copper.

This compound is fusible by heat below redness, and in close vessels is not decomposed by a strong red heat; but if air be freely admitted, it is dissipated in white fumes. It is insoluble in water, but

is soluble with effervescence in nitric acid, and without effervescence in muriatic. It consists of 36 chlorine, and 64 copper.

In the other compound, which the author calls Cuprane (a term that, in the language proposed by his brother, implies a substance containing more acid), the proportions are 53 chlorine, and 47 copper. This compound is also best obtained from the common deliquescent muriate by slow evaporation, carried ultimately to dryness, at a temperature not exceeding 400° of Fahrenheit; for if greater heat be applied, one portion of chlorine is expelled, and what remains is reduced to the state of cuprane and resin copper.

In addition to the foregoing, there is also a native muriate of copper, which, by the author's analysis, consists of 73 brown oxide, 16·2 muriatic acid, and 10·8 water.

This compound has also been imitated by Proust; and Mr. J. Davy has also found various methods of making the same combination.

Tin also forms two compounds with chlorine, one already known under the name of the fuming liquor of Libavius, which the author calls Stannanea, most readily obtained by heating together an amalgam of tin with corrosive sublimate; and a second analogous to the former, made by the substitution of calomel, and accordingly containing a less proportion of chlorine, and therefore called stannane.

The former contains 42·1 tin, with 57·9 chlorine.

The latter ——— 62·22 tin, — 37·78 chlorine.

The only new and remarkable property of the liquor of Libavius observed by Mr. J. Davy, is its action upon oil of turpentine, which in one experiment was so violent as to occasion inflammation. In other instances oxide of tin seemed to be formed, and a tenacious oil, having a smell somewhat like camphor.

Beside these compounds of tin with chlorine alone, there is also a submuriate observed by Proust, containing about 70·4 grey oxide, 19 muriatic acid, and 10·6 water.

With iron likewise, as well as with the former metals, there are two compounds with chlorine, which may either be formed by direct union with oxymuriatic gas, or may be obtained by evaporating to dryness the green and red muriates of iron. When thus deprived of water, they receive the name of Ferrane and Ferranea. The former contains 46·57 iron, and 53·43 chlorine; the latter 35·1 iron, and 64·9 chlorine.

With other metals that have been tried by the author, such as manganese, lead, zinc, arsenic, antimony, and bismuth, he has not found that chlorine combines in more than one proportion.

The compound with manganese bears a red heat, in close vessels, without decomposition; but when it is heated in an open vessel, muriatic acid fumes are evolved, and oxide of manganese remains. It appears to consist of 54 chlorine, and 46 manganese.

The muriate of lead, known by the name of Horn lead, but called by the author Plumbane, was found to contain 74·23 lead, and 25·77 chlorine.

Butter of zinc, obtained by distilling to dryness the muriate of zinc, was found to consist of exactly equal parts of the two ingredients.

The fuming butter of arsenic was found to contain nearly 60 chlorine to 40 arsenic. This compound has the property of dissolving phosphorus when gently heated, but to part with it on being cooled. It also readily dissolves sulphur when warmed, and yields crystals of sulphur by cooling. It likewise dissolves resins, oil of turpentine, or olive oil; and in these respects resembles the compounds of sulphur or phosphorus with chlorine, which have the same property of entering into combination with fixed and volatile oils.

In this respect also the butter of antimony was found to agree with the same compounds; and in the proportion of its constituent parts, to be as nearly as possible the reverse of the preceding.

It is remarked concerning these compounds, in general, of metals with chlorine, that their volatility or fusibility are in no degree correspondent to the qualities of the metals of which they consist. One of the compounds of iron, for instance, is volatile; but those of bismuth, zinc, and lead, are even less fusible than the metals themselves.

In order to correct the preceding analysis, the author has had recourse to the general analogy of definite proportions; and since one of hydrogen unites with 7.5 oxygen, or with 33.6 chlorine, the compounds of chlorine have been compared with the oxides of the same metals; and in the instances of copper, iron, zinc, and arsenic, have been found to agree correctly with the analyses of oxides by other chemists; and where such agreement has been wanting, it has been obtained by new analyses of the oxides of tin, lead, antimony, and bismuth.

In making similar comparisons of the compounds of the same metals with sulphur, four instances of correspondence were found in tin, lead, antimony, and bismuth; but others were observed not to accord with the proportions assigned.

The author concludes with observing the degree of analogy that subsists between the oxides of metals, and their compounds, with chlorine; horn silver, resin copper, horn lead, and corrosive sublimate, being each soluble in excess of muriatic acid, although the last is even less soluble in nitric or sulphuric acids than in mere water.

Further Experiments and Observations on the Action of Poisons on the Animal System. By B. C. Brodie, Esq. F.R.S. Communicated to the Society for the Improvement of Animal Chemistry, and by them to the Royal Society. Read February 27, 1812. [*Phil. Trans.* 1812, p. 205.]

In the description of the author's former experiments on the same subject, he entered more into the detail of particular occurrences than he now thinks necessary. He was formerly apprehensive that the operations of the same poison might not be always the same, and was